

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mark Guttag on 3/31/10.

In claim 2, line 15, replace "*bonding portions to spread and new gold*" with -- bonding portions to spread by spreading the adhering substance layer which causes a new gold --

In claim 3, line 17, replace "*bonding portions to spread and new gold*" with -- bonding portions to spread by spreading the adhering substance layer which causes a new gold --

In claim 50, line 11, replace "*have a hardness of 20 Hv to 200 Hv*" with --are formed of gold --

In claim 50, line 14, replace "*bonding portions to spread and new gold*" with -- bonding portions to spread by spreading the adhering substance layer which causes a new gold --

Reasons for Allowance

Claims 2-20, 22-24 and 50 are allowed.

The following is an examiner's statement of reasons for allowance:

Prior art fails to teach crushing irregularities on a bonding surface of bonding portions in a solid phase between room temperature and 180 °C, wherein at least some adhering substances readhere to the bonding portions after an energy wave treatment and said bonding portions are formed of gold [support for amended limitations is found on pg. 17, lines 5-23 of the specification and figs. 2A-B].

Yamauchi (WO 2003/001858 A1) discloses treating bonding portions with plasma and then bonding (gold/gold) in a solid phase at low temperature of about 150 °C, but does not disclose any readhering substances or the step of crushing irregularities on a bonding surface so as to cause a new gold surface to appear at the bonding interface.

Suga (US 2003/0164396 A1) discloses a thermally bonding method which treats bonding surfaces (includes gold/gold) by an energy wave to remove adhering oxides and thus teaches away from any readhering substances. Suga also fails to disclose crushing irregularities on a bonding surface and bonding between room temperature and 180 °C.

Gosele (NPL journal article) is directed to bonding silicon wafers in an atmospheric air and crushing an adhering oxide layer at room temperature, however, Gosele does not teach gold bonding portions or forming a new gold surface to appear at the bonding interface.

Moreover, no motivation was found for one of ordinary skill in the art to modify prior art surface-activated bonding methods so as to form an adhering substance layer and to spread the adhering substance layer at the bonding interface by crushing irregularities under the claimed conditions.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVANG PATEL whose telephone number is (571)270-3636. The examiner can normally be reached on Monday thru Thursday, 8:00 am to 5:30 pm, EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devang Patel/
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793